United States Department of the Interior

FISH AND WILDLIFE SERVICE
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IN REPLY REFER TO:
1-1-03-F-0248

Memorandum

To: Michael J. Tollefson, Superintendent, Yosemite National Park, U.S. National Park Service, Yosemite, California

From: Cay C. Goude, Assistant Field Supervisor, Sacramento Fish and Wildlife Office, Sacramento, California

Subject: Formal Endangered Species Consultation on the Yosemite Fire Management Plan, Yosemite National Park, California

This is in response to your request for formal consultation with the U.S. Fish and Wildlife Service (Service), pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.) (Act), on the Yosemite Fire Management Plan. At issue are project effects to the endangered Sierra Nevada bighorn sheep (*Ovis canadensis californiana*), the threatened bald eagle (*Haliaeetus leucocephalus*), the threatened California red-legged frog *(Rana aurora draytonii*), and the Valley elderberry longhorn beetle (*Desmocerus californicus*). The Service received your request for formal consultation and the May 2002, *Draft Yosemite Fire Management Plan, Environmental Impact Statement* (DEIS) on May 23, 2002. On June 11, 2003, we received the final additional information requested by this office.

Based on the Service's review of the DEIS, we concur with your determination that the Yosemite Fire Management Plan is not likely to adversely affect the Sierra Nevada bighorn sheep or the bald eagle. The Service also concurs with your determination that the Yosemite Fire Management Plan may affect, but is not likely to adversely affect the California red-legged frog. Therefore, unless new information reveals effects of the proposed action in a manner or to an extent not considered, no additional consultation for these species is necessary. The proposed action may adversely affect the valley elderberry longhorn beetle.

Yosemite National Park provides habitat for the mountain yellow-legged frog (*Rana muscosa*) and Yosemite toad (*Bufo canorus*), both candidates for listing. Although the Act does not afford these species the protections provided to federally listed animals, we are monitoring their status and are providing recommendations for these species in the Conservation Recommendations section of the biological opinion. Yosemite National Park has included Mitigation Measures Common to All Action Alternatives (Mitigation Measures) to minimize effects for these species. We are also providing recommendations for these species in the Conservation Recommendations section of the biological opinion.

The Service has received petitions to list the California spotted owl *(Strix occidentalis occidentalis*) and the fisher (*Martes pennanti*) as threatened and endangered species. The Service believes that it is in the best interest of Yosemite National Park to incorporate all practical measures that would minimize negative impacts to these species. Yosemite National Park has included Mitigation Measures to minimize effects

for these species. We are also providing recommendations for these species in the Conservation Recommendations section of the biological opinion.

This biological opinion is based on information provided in: (1) the DEIS; (2) additional information received April 1, 2003; (3) additional information, *Mitigation Measures Common to All Action Alternatives*, received June 11, 2003; and (4) additional information located in Service files. A complete administrative record is on file at the Sacramento Fish and Wildlife Office.

CONSULTATION HISTORY

May 23, 2002. The Service received the DEIS for review.

July 25, 2002. Meeting between Kathy Brown of this office and Yosemite National Park staff to conduct on-site visits, and discuss the Draft Fire Management Plan and associated biological assessment.

September 3, 2002. The Service received additional information from Yosemite National Park regarding the quantity of elderberry plants within the El Portal Wildland Urban Interface and Burn Units.

November 19, 2002. Meeting between Kathy Brown of this office and Yosemite National Park staff to discuss species specific issues.

December 17, 2002. The Service received additional information: the November 7, 2002, *Elderberry Plants in the El Portal Wildland Urban Interface*

April 1, 2003. The Service received the following additional information from Yosemite National Park: the February 2003, *Monitoring Plan: Elderberry Plants within the El Portal Wildland-Urban Interface;* and the February 2003, El Portal Prescribed Burn Rotation Plan in Relation to Elderberry Plants.

June 11, 2003. The Service received the following additional information from Yosemite National Park: *Mitigation Measures Common to all Action Alternatives.*

June 25, 2003. The Service sent a draft Biological Opinion to Yosemite National Park.

July 28, 2003. In a phone conversation between Lisa Acree of Yosemite National Park and Kathy Brown of this office, comments regarding the draft Biological Opinion were discussed.

BIOLOGICAL OPINION

Description of the Proposed Action

The following project description was derived mainly from information presented in the DEIS. Additional information is from sources in the Service's administrative record.

Since 1968, National Park Service policy has been to allow natural processes to occur. The fire management program has pursued this policy for over three decades, yet has not been able to meet park land management objectives of restoring ecosystems and providing protection for developed areas and cultural resources. The long-term buildup of fuels has continued under the existing plan in many areas of Yosemite National Park and the El Portal Administrative Site. Increased application of prescribed fire and additional methods of reducing fuels are needed to restore fire to ecosystems and reduce forest fuels in at-risk areas.

The proposed alternative in the DEIS divides Yosemite National Park into two geographic units: the Fire Use Unit and the Suppression Unit. Each unit would be managed with different techniques and objectives based on existing conditions and needs. A thorough description of the proposed project can be found in the DEIS. The following summarizes most of the actions proposed under the proposed alternative.

The Fire Use Unit is the largest management unit and contains 83% (or 619,888 acres) of Yosemite National Park. The Fire Use Unit is a large, relatively contiguous landscape where old forest conditions and associated ecological processes more or less predominate. Plant communities tend to match target conditions and, in general, naturally occurring fires have taken place at a rate that matches the natural fire return interval. Fuel loads tend to be within the normal range of variability. Vegetation communities in the Fire Use Unit have burned and would continue to burn under the proposed alternative under conditions that are close to their natural fire regime. Lightning would ignite fires in this unit. A lightning-ignited fire in this unit would be assessed and allowed to burn if it met conditions that would maintain or restore the target conditions for the area, and if it met criteria for potential fire behavior for the area, relative risks, and the complexity of the fire. Occasionally, a lightning-induced fire that was controlled due to high fire danger, lack of personnel, or harmful air quality would be re-ignited up to 3 years past the date of the original fire to simulate the benefits of the extinguished fire.

The remaining 17% (or 128,067 acres) of Yosemite National Park is in the Suppression Unit. The Suppression Unit contains areas where fires have been suppressed for decades. In mid- elevation forests along the western boundary of Yosemite National Park, fuel loads are high and plant community structure has changed, largely due to past fire exclusion. As a result, the risk of catastrophic wildland fire could be high in many areas. The Suppression Unit was delineated to reintroduce fire into fire-dependent ecosystems, move toward natural fire regimes, and to protect developed areas and other human values. This would be mainly done through prescribed burning. The initial response to a wildland fire in this unit would be aggressive and immediate suppression. Depending on their location and designation, lands in the Suppression Unit would be managed with different strategies. Burn units would be managed with prescribed fire treatments to reintroduce fire into fire-dependent ecosystems and move toward natural fire regimes, support treatments in developed areas (Wildland Urban Interface) (WUI), and protect sensitive and highly valued areas. WUIs are designated where human habitation meets areas of flammable wildland vegetation. The intention of fire management in these areas is to protect human communities from wildland fires as well as minimize the spread of fires that originate in urban areas. Fuels may be removed with mechanical clearing or one of several other treatments including prescribed burning. After portions of landscapes are brought into a more defensible and fire-resilient condition (as defined by restoration target conditions), they would require periodic maintenance. About 1,095 acres would be treated each year. It is expected to take about 6 to 8 years to achieve the initial goals for WUIs. Distribution of the valley elderberry longhorn beetle habitat in the area administered by Yosemite National Park is restricted to the El Portal Administrative Site, located in the Suppression Unit.

As described in the DEIS, the proposed alternative would accomplish goals by using various restoration, maintenance, and fuel reduction strategies within the Suppression and Fire Use areas. In addition to prescribed fire and managed wildland fire, a combination of aggressive and passive techniques to remove hazardous fuels would be utilized. Aggressive techniques may include mechanical tree and shrub removal with the use of feller-bunchers and forwarders, conventional tree and shrub removal with the use of saws, skidders and grapplers, machine crushing and shredding, and machine piling. Secondary canopy trees would be removed from the forest in some areas to achieve a desired semi-open canopy condition. Passive techniques may include yarding with the use of yarders or fetching arches, hand cutting and piling, cutting and chipping, low-impact skidding, girdling, and limb removal. Additional options designated “Lower Fuel Profile Treatment Options” that may be used in sensitive areas are pile burning, pile and leave, lop and scatter, chip and broadcast burn, chip and broadcast material, and chip and haul.

Status of the Species and Environmental Baseline

The valley elderberry longhorn beetle was listed as a threatened species under the Act on August 8, 1980 (45 **FR** 52803). Critical habitat for the species was designated and published at 50 CFR §17.95. Two areas along the American River in the Sacramento metropolitan area have been designated as critical habitat for the valley elderberry longhorn beetle. Critical habitat for this species has been designated along the lower American River at Goethe and Ancil Hoffman parks (American River Parkway Zone) and at the Sacramento Zone, an area about a half-mile from the American River downstream from the American River Parkway Zone. In addition, an area along Putah Creek, Solano County, and the area west of Nimbus Dam along the American River Parkway, Sacramento County, are considered essential habitat, according to the *Valley Elderberry Longhorn Beetle Recovery Plan* (Recovery Plan) (USFWS 1984). These areas support large numbers of mature elderberry plants with extensive evidence of use by the valley elderberry longhorn beetle.

The valley elderberry longhorn beetle is dependent on its host plant, elderberry (*Sambucus* sp.), which is a locally common component of the remaining riparian forests and savannah areas and, to a lesser extent, the mixed chaparral-foothill woodlands of the Central Valley. Use of the elderberry plants by the animal, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the plant's use by the valley elderberry longhorn beetle is an exit hole. Observations made within elderberry plants along the Cosumnes River, in the Folsom Lake area, and near Blue Ravine in Folsom indicate that larval galleries can be found in elderberry stems with no evidence of exit holes; the larvae either succumb prior to constructing an exit hole or are not far enough along in the developmental process to construct an exit hole. Larvae appear to be distributed in stems which are 1.0 inch or greater in diameter at ground level. The Recovery Plan and Barr (1991) contain further details on the valley elderberry longhorn beetle's life history.

Population densities of the valley elderberry longhorn beetle are probably naturally low (USFWS 1984). It has been suggested, based on the spatial distribution of occupied plants (Barr 1991), that the valley elderberry longhorn beetle is a poor disperser. Low density and limited dispersal capability cause the valley elderberry longhorn beetle to be vulnerable to the negative effects of the isolation of small subpopulations due to habitat fragmentation.

When the valley elderberry longhorn beetle was listed as threatened on August 8, 1980, the species was known from less than 10 localities along the American River, the Merced River, and Putah Creek. By the time the Recovery Plan was prepared in 1984, additional species localities had been found along the American River and Putah Creek. As of 1998, the California Natural Diversity Database (CNDDB) included 181 occurrences for this species in 44 drainages throughout the Central Valley, from a location along the Sacramento River in Shasta County, southward to an area along Caliente Creek in Kern County (CNDDB 1998). The valley elderberry longhorn beetle continues to be threatened by habitat loss and fragmentation, invasion by Argentine ants (*Linepithema humile*), and possibly other factors such as pesticide drift, exotic plant invasion, and grazing.

The following paragraphs analyze the effects of past and ongoing factors leading to the current status of the species, its habitat and ecosystem, throughout the species' range. It includes an analysis of effects from projects that have received incidental take authorization for the valley elderberry longhorn beetle since the species was listed, and an evaluation of conservation efforts aimed at minimizing these effects, based on the best available information.

Habitat loss has been ranked as the single greatest threat to biodiversity in the United States (Wilcove *et al.* 1998). In the 1980 final rule to list the valley elderberry longhorn beetle as threatened, habitat destruction was cited as the primary factor contributing to the need to federally list the species (45 **FR** 52803). As stated in the final rule, by the time the species was listed its habitat had largely disappeared throughout much of its former range due to agricultural conversion, levee construction, and stream

channelization. The 1984 recovery plan reiterated that the primary threat to the valley elderberry longhorn beetle was loss and alteration of habitat by agricultural conversion, grazing, levee construction, stream and river channelization, removal of riparian vegetation, riprapping of shoreline, plus recreational, industrial and urban development (USFWS 1984).

Riparian forests, the primary habitat for the valley elderberry longhorn beetle, have been severely depleted throughout the Central Valley over the last two centuries as a result of expansive agricultural and urban development (Katibah 1984, Thompson 1961, Roberts *et al.* 1977). Since colonization, these forests have been "...modified with a rapidity and completeness matched in few parts of the United States" (Thompson 1961). As of 1849, the rivers and larger streams of the Central Valley were largely undisturbed. They supported continuous bands of riparian woodland four to five miles in width along some major drainages such as the lower Sacramento River, and generally about two miles wide along the lesser streams (Thompson 1961). Most of the riverine floodplains supported riparian vegetation to about the 100-year flood line (Katibah 1984). A large human population influx occurred after 1849, however, and much of the Central Valley riparian habitat was rapidly converted to agriculture and used as a source of wood for fuel and construction to serve a wide area (Thompson 1961). By as early as 1868, riparian woodland had been severely impacted in the Central Valley, as evidenced by the following excerpt:

> This fine growth of timber which once graced our river [Sacramento], tempered the atmosphere, and gave protection to the adjoining plains from the sweeping winds, has entirely disappeared - the woodchopper's axe has stripped the river farms of nearly all the hard wood timber, and the owners are now obliged to rely upon the growth of willows for firewood. (Cronise 1868, *in* Thompson 1961).

The clearing of riparian forests for fuel and construction made this land available for agriculture (Thompson 1977). Natural levees bordering the rivers, once supporting vast tracts of riparian habitat, became prime agricultural land (Thompson 1961). As agriculture expanded in the Central Valley, needs for increased water supply and flood protection spurred water development and reclamation projects. Artificial levees, river channelization, dam building, water diversion, and heavy groundwater pumping further reduced riparian habitat to small, isolated fragments (Katibah 1984). In recent decades, these riparian areas have continued to decline as a result of ongoing agricultural conversion as well as urban development and stream channelization. As of 1989, there were over 100 dams within the Central Valley drainage basin, as well as thousands of miles of water delivery canals and streambank flood control projects for irrigation, municipal and industrial water supplies, hydroelectric power, flood control, navigation, and recreation (Frayer *et al.* 1989). Riparian forests in the Central Valley have dwindled to discontinuous strips of widths currently measurable in yards rather than miles.

Some accounts state that the Sacramento Valley supported about 775,000 to 800,000 acres of riparian forest around 1848, just prior to statehood (Smith 1977, Katibah 1984). No comparable estimates are available for the San Joaquin Valley. Based on early soil maps, however, more than 921,000 acres of riparian habitat are believed to have been present throughout the Central Valley under pre-settlement conditions (Katibah 1984). Another source estimates that of approximately 5 million acres of wetlands in the Central Valley in the 1850s, about 1,600,000 acres were riparian wetlands (Warner and Hendrix 1985, Frayer *et al.* 1989).

Based on a California Department of Fish and Game (CDFG 1992) riparian vegetation distribution map, by 1979, there were about 102,000 acres of riparian vegetation remaining in the Central Valley. This represents a decline in acreage of 89% as of 1979 (Katibah 1984). More extreme figures were given by Frayer *et al.* (1989), who reported that woody riparian forests in the Central Valley had declined to 34,600 acres by the mid-1980s (from 65,400 acres in 1939). Although these studies have differing findings in terms of the number of acres lost (most likely explained by differing methodologies), they attest to a dramatic historic loss of riparian habitat in the Central Valley. As there is no reason to believe that riparian habitat suitable to the valley elderberry longhorn beetle (occupied by elderberry plants) would be

destroyed at a different rate than other riparian habitat, we can assume that the rate of loss for valley elderberry longhorn beetle habitat in riparian areas has been equally dramatic.

A number of studies have focused on riparian loss along the Sacramento River, which supports some of the densest known populations of the valley elderberry longhorn beetle. Approximately 98% of the middle Sacramento River's historic riparian vegetation was believed to have been extirpated by 1977 (DWR 1979). The State Department of Water Resources (DWR) estimated that native riparian habitat along the Sacramento River from Redding to Colusa decreased from 27,720 acres to 18,360 acres (34%) between 1952 and 1972 (McGill *et al.* 1975, Conrad *et al.* 1977). The average rate of riparian loss on the middle Sacramento River was 430 acres per year from 1952 to 1972, and 410 acres per year from 1972 to 1977. In 1987, riparian areas as large as 180 acres were observed converted to orchards along this river (McCarten and Patterson 1987).

Barr (1991) examined 79 sites in the Central Valley supporting valley elderberry longhorn beetle habitat. When 72 of these sites were re-examined by researchers in 1997, seven no longer supported valley elderberry longhorn beetle habitat. This represents a decrease in the number of sites with valley elderberry longhorn beetle habitat by 9% in 6 years.

There is no comparable information on the historic loss of non-riparian valley elderberry longhorn beetle habitat such as elderberry savanna and other vegetation communities where elderberry occurs (oak or mixed chaparral-woodland, or grasslands adjacent to riparian habitat). However, all natural habitats throughout the Central Valley have been heavily impacted within the last 200 years (Thompson 1961), and we can therefore assume that non-riparian valley elderberry longhorn beetle habitat also has suffered a widespread decline. This analysis focuses on loss of riparian habitat because the valley elderberry longhorn beetle is primarily dependent upon riparian habitat. Adjacent upland areas are also likely to be important for the species (Huxel 2000), but this upland habitat typically consist of oak woodland or elderberry savanna bordering willow riparian habitat (Barr 1991). The riparian acreage figures given by Frayer *et al.* (1989) and Katibah (1984) included the oak woodlands concentrated along major drainages in the Central Valley, and therefore probably included lands we would classify as upland habitat for the valley elderberry longhorn beetle adjacent to riparian drainages.
Between 1980 and 1995, the human population in the Central Valley grew by 50%, while the rest of California grew by 37%. The Central Valley's population was 4.7 million by 1999, and it is expected to more than double by 2040. The American Farmland Trust estimates that by 2040 more than 1 million cultivated acres will be lost and 2.5 million more put at risk (Ritter 2000). With this growing population in the Central Valley, increased development pressure is likely to result in continuing loss of riparian habitat.

While habitat loss is clearly a large factor leading to the species' decline, other factors are likely to pose significant threats to the long term survival of the valley elderberry longhorn beetle. Only approximately 20% of riparian sites with elderberry observed by Barr (1991) and Collinge *et al.* (*in prep.*) support valley elderberry longhorn beetle populations (Barr 1991, Collinge *et al. in prep.*). Jones and Stokes (1988) found 65% of 4,800 riparian acres on the Sacramento River to have evidence of valley elderberry longhorn beetle presence. The fact that a large percentage of apparently suitable habitat is unoccupied suggests that the valley elderberry longhorn beetle is limited by factors other than habitat availability, such as habitat quality or limited dispersal ability.

Destruction of riparian habitat in central California has resulted not only in a loss of acreage, but also in habitat fragmentation. Fahrig (1997) states that habitat fragmentation is only important for habitats that have suffered greater than 80% loss. Riparian habitat in the Central Valley, which has experienced greater than 90% loss by most estimates, would meet this criterion as habitat vulnerable to effects of fragmentation. Existing data suggests that valley elderberry longhorn beetle populations, specifically, are affected by habitat fragmentation. Barr (1991) found that small, isolated habitat remnants were less likely to be occupied by valley elderberry longhorn beetles than larger patches, indicating that valley elderberry longhorn beetle subpopulations are extirpated from small habitat fragments. Barr (1991) and Collinge *et al.* (*in prep*.) consistently found valley elderberry longhorn beetle exit holes occurring in clumps of elderberry bushes rather than isolated bushes, suggesting that isolated plants do not typically provide long-term viable habitat for this species. Local populations of organisms often undergo periodic colonization and extinction, while the metapopulation (set of spatially separated groups of a species) may persist (Collinge 1996).

Habitat fragmentation can be an important factor contributing to species declines because: (1) it divides a large population into two or more small populations that become more vulnerable to direct loss, inbreeding depression, genetic drift, and other problems associated with small populations, (2) it limits a species' potential for dispersal and colonization, and (3) it makes habitat more vulnerable to outside influences by increasing the edge:interior ratio (Primack 1998). These factors, as they relate to the valley elderberry longhorn beetle, are discussed below.

Small, isolated subpopulations are susceptible to extirpation from random demographic, environmental, and/or genetic events (Shaffer 1981, Lande 1988, Primack 1998). While a large area may support a single large population, the smaller subpopulations that result from habitat fragmentation may not be large enough to persist over a long time period. As a population becomes smaller, it tends to lose genetic variability through genetic drift, leading to inbreeding depression and a lack of adaptive flexibility. Smaller populations also become more vulnerable to random fluctuations in reproductive and mortality rates, and are more likely to be extirpated by random environmental factors.

Species that characteristically have small population sizes, such as large predators or habitat specialists, are more likely to become extinct than species that typically have large populations (Primack 1998). Also, a species with low population density (few individuals per unit area) tends to have only small populations remaining if its habitat is fragmented. Populations of species that naturally occur at lower density become extinct more rapidly than do those of more abundant species (Bolger *et al.* 1991). The species may be unable to persist within each fragment, and gradually die out across the landscape.

The valley elderberry longhorn beetle, a specialist on elderberry plants, tends to have small population sizes, and to occur in low densities (Barr 1991, Collinge *et al. in prep*.). Collinge *et al.* (*in prep*.) compared resource use and density of exit holes between the valley elderberry longhorn beetle and a related subspecies, the California elderberry longhorn beetle (*Desmocerus californicus californicus*). The valley elderberry longhorn beetle tended to occur in areas with higher elderberry densities, but had lower exit hole densities than the California elderberry longhorn beetle. With extensive riparian habitat loss and fragmentation, these naturally-small valley elderberry longhorn beetle populations are broken into even smaller, isolated populations. Once a small valley elderberry longhorn beetle population has been extirpated from an isolated habitat patch, the species may be unable to re-colonize this patch if it is unable to disperse from nearby occupied habitat. Insects with limited dispersal and colonization abilities may persist better in large habitat patches than small patches because small fragments may be insufficient to maintain viable populations and the insects may be unable to disperse to more suitable habitat (Collinge 1996).

Studies suggest that the valley elderberry longhorn beetle is unable to re-colonize drainages where the species has been extirpated, because of its limited dispersal ability (Huxel 2000, Barr 1991; Collinge *et al. in prep*.). Huxel (2000) used computer simulations of colonization and extinction patterns for the valley elderberry longhorn beetle based on differing dispersal distances, and found that the short dispersal

simulations best matched the 1997 census data in terms of site occupancy. This suggests that in the natural system dispersal and thus colonization is limited to nearby sites. At spatial scales greater than 10 km., such as across drainages, valley elderberry longhorn beetle occupancy appears to be strongly influenced by regional extinction and colonization processes, and colonization is constrained by limited dispersal (Collinge *et al. in prep*.). Except for one occasion, drainages examined by Barr that were occupied in 1991 remained occupied in 1997 (Collinge *et al. in prep*.). The one exception was Stoney Creek, which was occupied in 1991 but not in 1997. All drainages found by Barr (1991) to be unoccupied in 1991 were also unoccupied in 1997. This data suggests that drainages unoccupied by the valley elderberry longhorn beetle remain so.

Habitat fragmentation not only isolates small populations, but also increases the interface between habitat and urban or agricultural land, increasing negative edge effects such as the invasion of non-native species (Huxel 2000, Soule 1990) and pesticide contamination (Barr 1991). There are several edge effect-related factors that may be related to the decline of the valley elderberry longhorn beetle.

Recent evidence indicates that the invasive Argentine ant poses a risk to the long-term survival of the valley elderberry longhorn beetle. Surveys along Putah Creek found valley elderberry longhorn beetle presence where Argentine ants were not present or had recently colonized, and valley elderberry longhorn beetle absence from otherwise suitable sites where Argentine ants had become established (Huxel 2000). The Argentine ant has negatively impacted populations of other native arthropod species (Holway 1998; Ward 1987). Predation on eggs, larvae, and pupae are the most likely impacts these ants have on the valley elderberry longhorn beetle. In Portugal, Argentine ants have been found to be significant egg predators on the eucalyptus borer (*Phorocantha semipunctata*), a cerambycid like the valley elderberry longhorn beetle. Egg predation on the valley elderberry longhorn beetle could lead to local extirpations, as indicated by a population viability study suggesting that egg and juvenile mortality are significant factors affecting probability of extinction for the valley elderberry longhorn beetle (Huxel and Collinge, *in prep*.). The Argentine ant has been expanding its range throughout California since its introduction around 1907, especially in riparian woodlands associated with perennial streams (Holway 1998, Ward 1987). Huxel (2000) states that, given the potential for Argentine ants to spread with the aid of human activities such as movement of plant nursery stock and agricultural products, this species may come to infest most drainages in the Central Valley along the valley floor, where the valley elderberry longhorn beetle is found.

Direct spraying and drift of pesticide, including herbicides and/or insecticides, in or near riparian areas (which is done to control mosquitos, crop diseases, invasive and/or undesirable plants, or other pests) is likely to adversely affect the valley elderberry longhorn beetle and its habitat. Although there have been no studies specifically focusing on the effects of pesticides on the valley elderberry longhorn beetle, evidence suggests that the species is likely to be affected by pesticides. As of 1980, the prevalent land use adjacent to riparian habitat in the Sacramento Valley was agriculture, even in regions where agriculture was not generally the most common land use (Katibah *et al.* 1984), therefore the species is likely vulnerable to pesticide contamination from adjacent agricultural practices. Recent studies of major rivers and streams documented that 96% of all fish, 100% of all surface water samples and 33% of major aquifers contained one or more pesticides at detectable levels (Gilliom 1999). Pesticides were identified as one of the 15 leading causes of impairment for streams included on the Federal Water Pollution Control Act, as amended (Clean Water Act), section 303(d) lists of impaired waters. As the valley elderberry longhorn beetle occurs primarily in riparian habitat, the contamination of rivers and streams affects this species and its habitat. Pesticides have been identified as one of a number of potential causes of pollinator species' declines and declines of other insects beneficial to agriculture (Ingraham *et al.* 1996), therefore it is likely that the valley elderberry longhorn beetle, typically occurring adjacent to agricultural lands, has suffered a decline due to pesticides.

Competition from invasive exotic plants such as giant reed (*Arundo donax*) negatively affects riparian habitat supporting the valley elderberry longhorn beetle. Giant reed, a native of Asia, has become a serious problem in California riparian habitats, forming dense, homogenous stands essentially devoid of

wildlife (Rieger and Kreager 1989). This species growing up to 2.5 inches per day and yielding 8.3 tons of oven-dry cane per acre (Rieger and Kreager 1989, Perdue 1958), tolerates drought, floods, and extreme temperatures, and is not significantly affected by insects, disease, herbivory, fire, or mechanical disturbance. It has an extensive root system allowing it to resprout rapidly after any disturbance and out-compete native riparian vegetation. Giant reed also introduces a frequent fire cycle into the riparian ecosystem, disrupting natural riparian dynamics and eventually forming homogenous climax communities. The extent to which giant reed has affected elderberry specifically, however, has not been studied.

Livestock grazing damages or destroys elderberry plants and inhibit regeneration of seedlings. Cattle readily forage on new elderberry growth, which may explain the absence of valley elderberry longhorn beetles at manicured elderberry stands (USFWS 1984). Habitat fragmentation exacerbates problems related to exotic species invasion and cattle grazing by increasing the edge:interior ratio of habitat patches, facilitating penetration of these influences.

The valley elderberry longhorn beetle is found in areas below 3,000 feet in elevation that support the elderberry plant. The El Portal area is the only area in Yosemite National Park that lies below 3,000 feet in elevation. Within the El Portal area, elderberry plants represent a subdominant species within interior live oak forests, live oak forests, interior live oak woodlands, blue oak woodlands, canyon live oak forests, mixed north slope forests, foothill pine/live oak/chaparral woodlands, northern mixed chaparral, interior live oak chaparral, and westside ponderosa pine forests in the project area. No elderberry plants occur within riparian areas. The closest record of an occurrence of the valley elderberry longhorn beetle is 16.5 miles southwest of El Portal near the town of Mariposa, recorded in 1974. Current management of elderberry plants in El Portal follows the Service's July 9, 1999, *Conservation Guidelines for the Valley Elderberry Longhorn Beetle*.

Yosemite National Park consulted with the Service on the Yosemite Valley Plan (Service file 1-1-00-F-0196) that included removal of existing structures, new construction, and vegetative management in El Portal. As a result of proposed project related impacts to elderberry plants, Yosemite National Park will establish a 22.55 acre valley elderberry conservation area to compensate for the loss of up to 124 plants with 651 stems large enough to harbor beetle larvae. To date, none of the projects that would impact elderberry plants have been implemented. Therefore, the conservation area has not been utilized. Under the proposed Yosemite Fire Management Plan, about 40% of elderberry plants are within burn units that overlap with Yosemite Valley Plan El Portal project areas. Therefore, the Yosemite Valley Plan biological opinion may be amended to reflect a change in baseline for the elderberry plants.

EFFECTS OF THE PROPOSED ACTION

Within the project area, up to 134 elderberry plants with stems measuring one inch in diameter or greater at ground level could be directly affected by the proposed project. A total of 527 stems large enough to harbor beetle larvae could be directly impacted. Valley elderberry longhorn beetle adults, eggs, and larvae inhabiting these plants/stems may be harassed or killed during the prescribed burning. All elderberry plants with evidence of valley elderberry beetle exit holes, of which none are recent (currently 14 exit holes are known), would be protected during prescribed fires by reducing fuel or applying water around the perimeter of the plant. Fuels, such as grasses and small twigs, in the periphery of these elderberry plants would be reduced by scraping vegetation or mowing. Prescribed fire units are small and will be closely monitored. Prescribed fires in valley elderberry beetle habitat would be ignited when conditions would produce moderate intensity fires. Elderberry plants, as most others in the foothill woodland community, are fire adapted. Periodic, high-intensity fires are natural in this community. If flame lengths near an elderberry plant containing exit holes reach greater than 2-4 feet, the fire in the area would be extinguished.

Injury or death could occur if prescribed burns occurred during the valley elderberry longhorn beetle's emergence and mating period (March 15 through June 15). No recent exit holes are known to exist in the El Portal area. Surveys conducted in 1997 located exit holes, and 2002 surveys of the same areas detected no new exit holes .

Indirect effects to the beetle could result from habitat fragmentation through the burning of elderberry plants. Habitat fragmentation can inhibit dispersal and colonization of beetles between remaining habitat areas. Fragmentation may lead to population declines and localized extinctions by dividing a population into smaller, isolated subpopulations in restricted areas. These smaller populations may then be adversely affected by inbreeding depression, genetic drift, and other problems associated with small population size (Primack 1998). Occupancy of elderberry plants after a burn may be lower than in elderberry plants that have not been burned (Holyoak, M., *pers. comm.*).

To minimize effects of loss of habitat, Yosemite National Park developed the February 2003, *El Portal Prescribed Burn Rotation Plan in Relation to Elderberry Plants* (prescribed fire rotation plan) (See Appendix A). Prescribed fire within 20 burn units in El Portal will be systematically implemented to provide protection and sustainability of elderberry plants. Treatment of burn units will be managed to retain unburned units adjacent to burned units to minimize habitat fragmentation. If data collected indicates that there is insufficient regeneration, burning will be delayed. All plants with exit holes will be protected from fire. Table 1 below depicts the burn unit rotation and number of plants that could be affected.

Table 1. Burn Unit Rotation

Year	Burn Unit	Plants detected in 2000 survey
1	4A West; 3A; 3B; 8A; 5B	31
2	8B; 1A; 2B; 10	8
3	1B; 4B; 9: 2A	13
4	9A; 5A; 4C; 4A East	24
5	7; 2C; 1C; 8C	58

To monitor the effects of prescribed burning on elderberry plants, Yosemite National Park developed the February 2003, *Monitoring Plan: Elderberry Plants within the El Portal Wildland-Urban Interface* (monitoring plan) (see Appendix B). Each elderberry plant has been mapped and given a reference number. Baseline, preburn, and postburn data will be collected, and information will be used to assess effects of prescribed burning on valley elderberry longhorn beetle habitat.

During prescribed burning, moderate- to high-intensity fires would remove the decadent and decaying portions of elderberry plants and stimulate new growth in the plant. n the event of an intense burn, elderberry plants are adapted to crown-sprout. In addition, actions taken under the proposed action will reduce the chance of catastrophic fire in El Portal.

The Service does not anticipate any adverse effects to beetle critical habitat because it occurs well away from the proposed project area. Therefore, no further analysis of critical habitat for the beetle will be done for this biological opinion.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the Yosemite Fire Management Plan are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The Service is not aware of specific projects that might affect the beetle or its habitat that are currently under review by State, county, or local authorities. Nevertheless, continued human population growth in the Central Valley, in general, is expected to drive further development of agriculture, cities, industry, transportation, and water resources in the foreseeable future. Some of these future activities will not be subject to Federal jurisdiction (and thus are considered to enter into cumulative effects), and are likely to result in loss of riparian and other habitats where elderberry plants and the beetle occur.

CONCLUSION

It is the opinion of the Service that implementation of the Yosemite Fire Management Plan should not appreciably reduce the likelihood of both survival and recovery of this species in the wild by reducing reproduction, numbers, or distribution and therefore should not jeopardize the continued existence of the Valley elderberry longhorn beetle. The proposed action is not likely to result in destruction or adverse modification of critical habitat.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal Regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be undertaken by Yosemite National Park in order for the exemption in section 7(o)(2) to apply. Yosemite National Park has a continuing duty to ensure that the covered activity complies with the terms and conditions of this incidental take statement. If Yosemite National Park fails to adhere to the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of the incidental take, Yosemite National Park must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

AMOUNT OR EXTENT OF TAKE

The Service expects that incidental take of the valley elderberry longhorn beetle will be difficult to detect or quantify. The cryptic nature of these species and their relatively small body size make the finding of a dead specimen unlikely. The species occurs in habitats that make them difficult to detect. Due to the difficulty in quantifying the number of valley elderberry longhorn beetles that will be taken as a result of the proposed action, or the number of elderberry stems one inch or greater in diameter at ground level that will exist at any given burn year, the Service is quantifying take incidental to the project as the number

of elderberry plants (containing stems one inch or greater in diameter) that could become unsuitable for beetles due to direct or indirect effects as a result of the action.

Upon implementation of the following reasonable and prudent measures, incidental take associated with the Yosemite Fire Management Plan on the valley elderberry longhorn beetles in the form of harm, harassment, or mortality from habitat loss or direct mortality will become exempt from the prohibitions described under Section 9 of the Act for direct impacts; in addition, incidental take in the form of harm, harassment, or mortality associated with the Yosemite Fire Management Plan will be exempt from the prohibitions described under Section 9 of the Act for indirect impacts as a result of the management activities described. The incidental take associated with the proposed action is hereby exempted from prohibitions of take under Section 9 of the Act.

EFFECT OF THE TAKE

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the beetle or result in destruction or adverse modification of critical habitat for the beetle.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of the valley elderberry longhorn beetles:

1. Minimize the effects of project impacts to the valley elderberry longhorn beetles and to elderberry plants (habitat) throughout the proposed project area.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, Yosemite National Park must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure one (1):

    a. The measures described in the Mitigation Measures (see Appendix C) are hereby incorporated as conditions of this opinion that must be followed to the greatest extent practical. In the event that the measures for threatened or endangered species are not followed or are violated the Service must be notified immediately.

    b. Monitoring of elderberry plants will be conducted by park personnel approved by both Yosemite National Park and the Service.

    c. If new exit holes are discovered during the pre-burn or post-burn monitoring, the Service will be notified immediately. Modifications to the Prescribed Fire Burn Plan may occur if the valley elderberry longhorn beetles are recently known to be within or adjacent to a burn unit. A restriction on activities during the emergence and mating period (March 15 through June 15) may occur in this instance.

Reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take on a species that might result from the proposed action. The

Service believes that no more than the number of valley elderberry longhorn beetles inhabiting the number of elderberry plants per burn year rotation within the El Portal burn units will be incidentally taken, as depicted in Table 1. If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. Yosemite National Park must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Reporting Requirements

Yosemite National Park must provide the Service with annual reports of the results of the Monitoring Plan. The first report is due January 31, the first year after the first prescribed burn, and annually thereafter.

The Sacramento Fish and Wildlife Office is to be notified within three working days of the finding of any listed species or any unanticipated harm to the valley elderberry longhorn beetle. The Service contact person for this is the Chief, Endangered Species Division at (916) 414-6600.

Any dead or severely injured valley elderberry longhorn beetles found (adults, pupae, larvae, or eggs) shall be deposited in the Entomology Department of the California Academy of Sciences. The Academy's contact is the Senior Curator of Coleoptera at (415) 750-7239. All observations of valley elderberry longhorn beetles in any life stage-live, injured, or dead-or fresh beetle exit holes shall be recorded on California Natural Diversity Data Base (CNDDB) field sheets and sent to California Department of Fish and Game, Wildlife Habitat Data Analysis Branch, 1416 Ninth Street, Sacramento, California 95814.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

1) To minimize adverse impacts to the California spotted owl, the following measures should be incorporated into your project:

   a. Surveys of suitable spotted owl habitat using acceptable protocols should be conducted to document presence.
   b. All project related activities that may disturb California spotted owl breeding activity should not occur within one-quarter mile of a known nest site during the breeding season (February 1 to August 15), unless a qualified biologist determines that activities will not adversely affect California spotted owls.
   c. If a fire occurs near a known California spotted owl nest site, Yosemite National Park should assess the effects of the fire on the habitat, and the California spotted owls that occupied the area.
   a. Remove nonnative trout species from high mountain lakes and streams to allow the recolonization of historic habitat by these species.

   To minimize adverse impacts to the fisher, the following measures should be incorporated into your project:

a. Conduct surveys in suitable habitat.

3) To minimize adverse impacts to the mountain yellow-legged frog and the Yosemite toad, the following measures should be incorporated into your project:

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

Reinitiation – Closing Statement

This concludes formal consultation on the Yosemite Fire Management Plan. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Please contact Kathy Brown or Gary Burton of this office at (916) 414-6600, if you have any questions.

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